PRELIMINARY STUDY ON ANTIFUNGAL ACTIVITY OF *NEOLAMARCKIA MACROPHYLLA* LEAVES EXTRACT

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Introduction

Neolamarckia macrophylla, a member of the family Rubiaceae is one of the important tropical trees chosen for reforestation in Malaysia. It is a strong and fast growing tree that is able to adapt on degraded land, resistant to serious diseases and pests and has many economic benefits in the production of plywood, canoe and timber trade (Shi shi et al., 2020; Chang et al., 2014).

The barks of the trees are used to reduce the cholesterol level, relief tiredness, improving women infertility and as a source of a-glucosidase enzyme inhibitor to treat diabetic individual (Anisah et al., 2018; Halawena et al., 2011).

Neolamarckia macrophylla tree is closely related to Neolamarckia cadamba and therefore, it is likely to have many similarity of different characteristics.

The study on antimicrobial activity of the various extracts of the leaves of Neolamarckia cadamba has shown a significant antibacterial and antifungal activity (Pandey et al., 2016).

In comparison, there is lack of scientific research on different aspect of N. Macrophylla. In this study, we aimed to characterize the antifungal activity of N. macrophylla leaves extract to get an overview of its antimicrobial potential.

Sample Preparation & Extraction

The fresh leaves were washed using distilled water and surface sterilized with 90% ethanol. The leaves were then dried under shade and powdered (Patel et al., 2011)

About 10 gram of the leaves powder soaked in 70% methanol/Sterile distilled water. Next, the extracts were filtered through filter paper and dried at 40-55°C

The crude extract dissolved in 10% DMSO for preparation of 100 mg/ml, 50 mg/ml, 25 mg/ml and 12.5 mg/ml concentration of extract.

Antifungal Test

The antifungal activity was evaluated using the poisoned food technique (Amadioha, 2000).

Approximately 100 µL of each of the extracts were pipetted and spread onto the PDA plate.

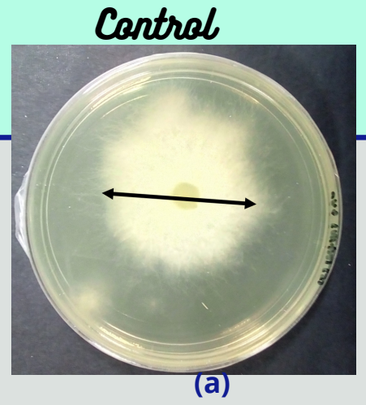
The mycelium block of each fungi were placed at the center of the PDA plates with the extract or DMSO for control.

The inoculated plates were incubated at 25

The diameters of fungal colonies were measured after 5 days of incubation.

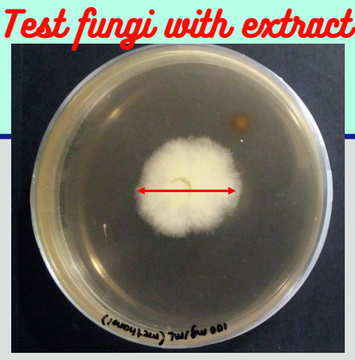
The percentage of mycelia growth inhibition (I) were calculated as below:

Control



(a)

Test fungi with extract



(b)

Figure 1: Diameter showing the growth of fungi.

(a) C mm: Diameter of fungal colony control (DMSO)
(b) T mm= Diameter of fungal colony with extract

$$I = (C-T)/C \times 100$$

Where,
I = Percentage of mycelial growth inhibition
C = Diameter of fungal colony (mean) in control
T = Diameter of fungal colony (mean) with extract

Results & Discussion

Sample	Concentration (mg/mL)	*Aspergillus niger* Diameter (mm)*	*Aspergillus niger* Percentage of Inhibition (%)	*Aspergillus flavus* Diameter (mm)*	*Aspergillus flavus* Percentage of Inhibition (%)	*Fusarium solani.* Diameter (mm)*	*Fusarium solani.* Percentage of Inhibition (%)
Control (DMSO)	-	51 ± 4.933	-	44 ± 1.155	-	70 + 4.583	-
Aqueous extraction	100	44 ± 3.606	14	22 ± 4.163	50	33 ± 16.462	53
	50	32 ± 15.503	37	19 ± 4.619	57	50 ± 1.528	29
	25	32 ± 4.619	37	21 ± 1.732	52	37 ± 3.055	47
	12.5	37 ± 5.859	27	30 ± 2.517	32	14 ± 2.517	80
Methanol extraction	100	47 ± 4.163	8	29 ± 1.732	34	67 ± 11.590	4
	50	30 ± 4.359	42	30 ± 9.165	32	57 ± 10.970	19
	25	40 ± 9.074	22	26 ± 7.000	41	57 ± 12.503	19
	12.5	32 ± 5.292	37	23 ± 6.351	48	45 ± 18.583	36

*Data are expressed as mean (n=3) + standard deviation

- In general, the growth of the test fungi showed a significant inhibition at the lowest concentration of both methanol and aqueous N. macrophylla crude extract.
- The results showed inconsistency of the percentage of growth inhibition of the test fungi with the increase concentration of the extract.
- The aqueous extract showed very promising inhibitory effect on the growth of F. solani. Meanwhile, the methanol extract showed a good inhibitory effect against A. flavus.

Acknowledgement

The author would like to thank UNIMAS for the support and providing the laboratory facilities and materials during the entire work.

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